Moose Creek Wastewater System

Sewage Works #120002193

Annual Report

Prepared for: Township of North Stormont

Reporting Period of January 1st – December 31st 2025

Issued: March 25, 2026

Revision: 0

Operating Authority:

OCWA

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

This report has been prepared to meet the requirements set out in:

Document	Document #	Issue Date	Issue Number
Facility CofA	3-1555-91-936	January 19, 1993	n/a
ECA for Municipal Sewage Collection System	182-W601	August 1, 2025	2

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1 Revision History

Date	Rev#	Revisions
2026-03-25	0	Annual Report Issued

2 Operations and Compliance Reliability Indices

Compliance Event	# of Events
Environment Canada Inspections	0
Ministry of Environment Inspections	0
Ministry of Labour Inspections	0
Non-Compliance	0
Community Complaints	0
Spills/Bypasses/Overflows	0
Sewer Main Blockages	0

3 System Process Description

Moose Creek's wastewater system began operation in 1995. It consists of a gravity fed sanitary sewage collection system, one pumping station and a wastewater treatment lagoon. The pumping station is located on Simeon Lane in Moose Creek and pumps wastewater from the collection system to the lagoon.

Moose Creek's sewage lagoon system consists of two facultative cells of equal size equipped with mechanical aeration. The cells are constructed with a high density polyethylene geomembrane liner and an underdrain system with an associated groundwater pumping station to prevent uplift of the liner. The total capacity of the lagoon system is 110,376 m^3. A chemical injection building is located on site housing a 10,000 litre storage tank and two chemical feed pumps (one duty and one standby). Aluminum sulphate is injected for phosphorus control as wastewater is pumped to the lagoons.

The lagoon operates on an annual discharge basis in accordance with the Environmental Compliance Approval. Effluent is discharged through a 400 mm outfall to the Moose Creek Drain.

4 Groundwater Monitoring Program

A groundwater monitoring/liner integrity program was initiated in 1995 as required under Condition 16 of the facility's Certificate of Approval. The initial findings indicated that groundwater at the lagoon site was characterized by nitrate and bacteriological contamination, likely associated with the historical agricultural use of the property. Appendix B contains the results of the 2025 Groundwater Monitoring Program carried out in accordance with the protocol set out in Golder Associates' report dated April 16, 2002. The report sets the lagoon liner leak trigger mechanism at > 0.33 mg/L nitrite or > 3.36 mg/L nitrate at the underdrain**.** Spring and fall samples are collected and compared to the trigger values.

Parameter	Trigger Value	Spring Result	Fall Result	Under Trigger Value
Nitrite	> 0.33 mg/L	< 0.05 mg/L	< 0.05 mg/L	Yes
Nitrate	> 3.36 mg/L	0.17 mg/L	0.80 mg/L	Yes

All groundwater sample results have remained fairly consistent over the duration of the program. The overall consistency of the data indictes that the lagoons have not adversely affected the quality of the groundwater.

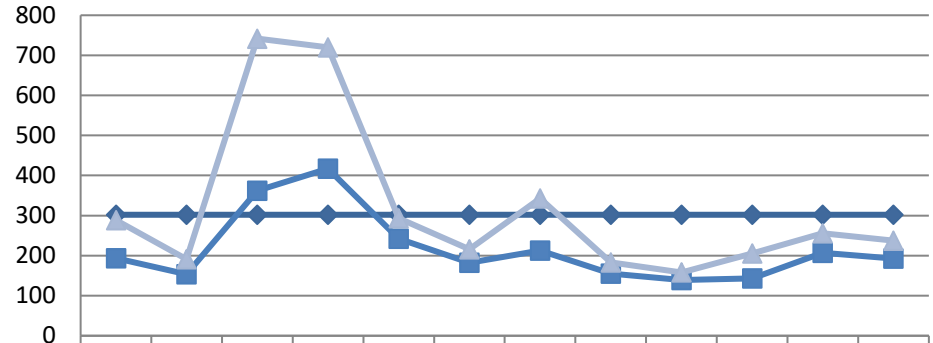
The charts in Appendix B illustrate historical spring and fall groundwater elevations in the lagoon's monitoring wells since 2002. The monitoring wells are arranged on the charts based on groundwater flow direction. The data indicates that the difference in elevation as the groundwater flows down gradient has remained relatively consistent over the duration of the monitoring program. It is expected that if groundwater mounding occurred at the site, the difference in elevation as the water flowed down gradient would begin to diminish. OCWA will continue to utilize the existing groundwater monitoring program in 2026.

5 Wastewater System Flows

The hydraulic flows reaching the sewage lagoons in 2025 averaged 217 m^3/day which represents 72 % of the 302 m^3/day design capacity.

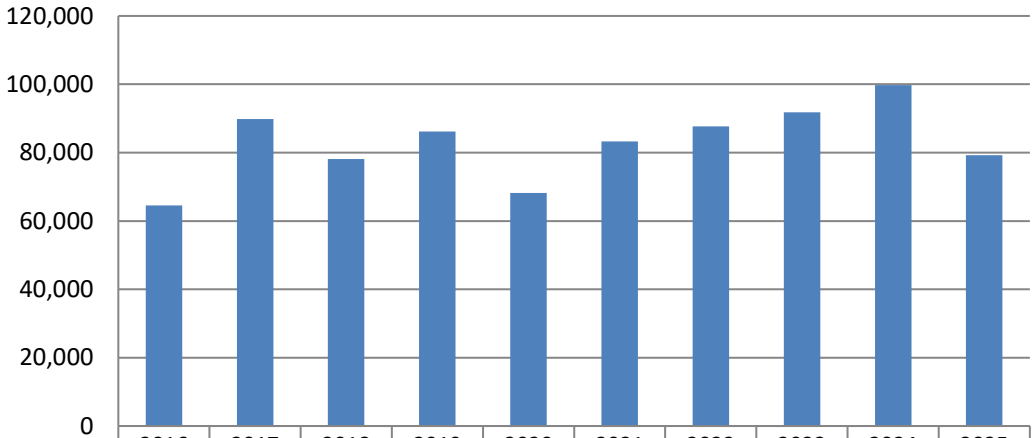
5.1 Raw Flows

2025 Raw Flows (m^3/d):



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Design Capacity (m3/d)	302	302	302	302	302	302	302	302	302	302	302	302
Avg Flow (m3/d)	194	154	362	417	242	183	212	155	139	144	207	193
Max Flow (m3/d)	289	191	742	720	293	216	343	183	158	206	256	237

Annual Raw Flow Comparison:



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Annual Flow (m3)	64,507	89,842	78,097	86,148	68,236	83,256	87,684	91,791	99,720	79,264

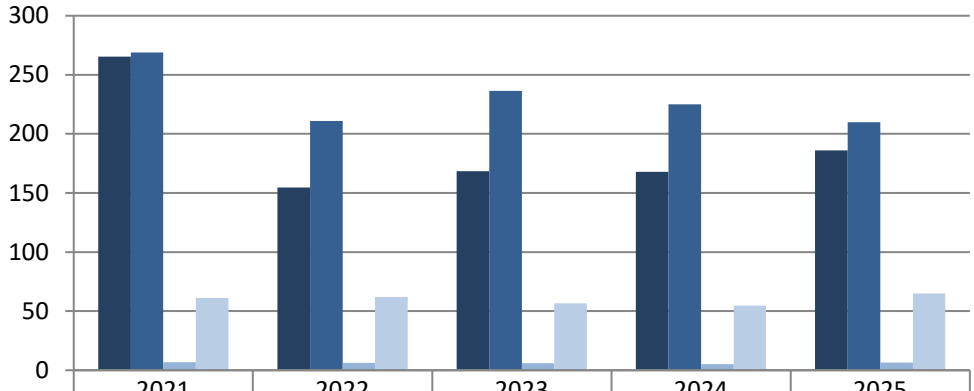
5.2 Effluent Flow

Discharge Period	Start Date	End Date	Volume Discharged (m^3)
Spring Discharge	April 11, 2025	April 28, 2025	64,454

6 Raw Sewage Quality

2025 monthly results are available in Appendix A – Performance Assessment Reports.

Annual Comparison (mg/L):

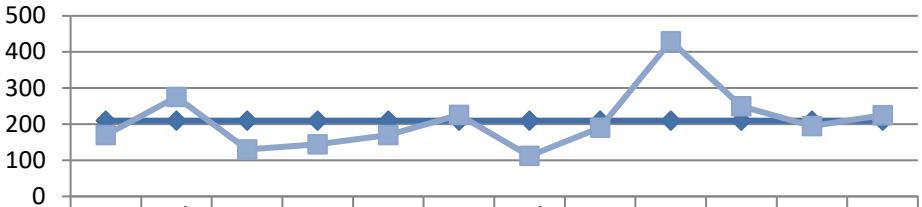


	2021	2022	2023	2024	2025
BOD5 Annual Average	265	155	168	168	186
TSS Annual Average	269	211	236	225	210
TP Annual Average	6.8	6.2	5.9	5.2	6.4
TKN Annual Average	61	62	57	55	65

6.1 Biochemical Oxygen Demand (5-Day)

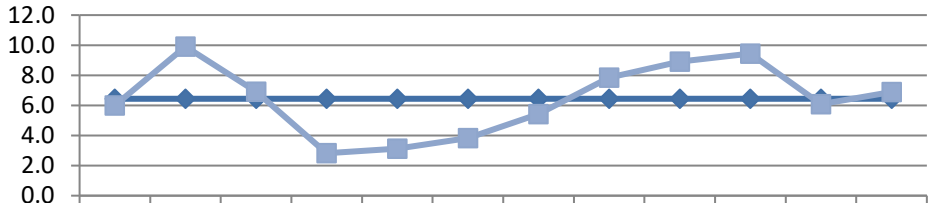
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Average (mg/L)	186	186	186	186	186	186	186	186	186	186	186	186
Monthly Results (mg/L)	175	305	336	68	133	151	106	149	308	241	102	152

6.2 Total Suspended Solids



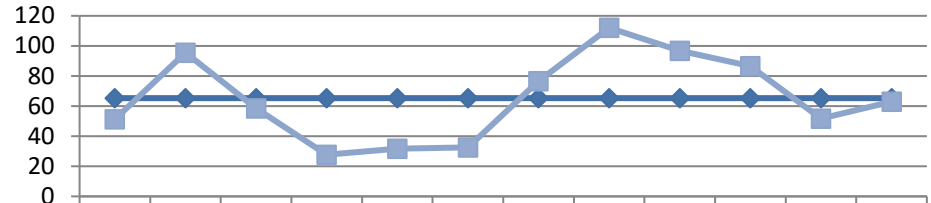
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Average (mg/L)	210	210	210	210	210	210	210	210	210	210	210	210
Monthly Results (mg/L)	170	275	130	144	170	226	112	190	430	250	195	225

6.3 Total Phosphorus



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Average (mg/L)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Monthly Results (mg/L)	6.0	9.9	6.9	2.8	3.1	3.8	5.4	7.8	8.9	9.5	6.1	6.9

6.4 Total Kjeldahl Nitrogen



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Average (mg/L)	65	65	65	65	65	65	65	65	65	65	65	65
Monthly Results (mg/L)	51	96	59	28	32	33	77	112	97	87	52	63

7 Effluent Quality

The effluent results from the spring discharge are tabulated below. For more detail on the sample results, including the upstream and downstream sample results, please refer to the Lagoon Performance Assessment Report in Appendix A.

7.1 Effluent Quality Assurance or Control Measures

This system is part of the Ontario Clean Water Agency's Nation Valley Cluster. The cluster is supported by the Eastern Regional Hub and corporate resources. Operational Services are provided by OCWA staff that work in the community. The system is operated to meet compliance with applicable regulations. The system has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents and are updated as required. These documents are also part of OCWA's Quality & Environmental Management System.

Effluent control measures include pre-discharge sampling and testing of lagoon cell contents prior to discharge. The samples are collected by the Ontario Clean Water Agency's competent and licensed staff using approved methods and protocols for sampling including those specified in the Ministry's Procedure F-10-1 "*Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works*", the Ministry's publication "*Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater*" and the publication "*Standard Methods for the Examination of Water and Wastewater*".

All effluent samples collected during the reporting period to meet legislated sampling requirements were

submitted to Caduceon Environmental Laboratories in Ottawa for analysis, with the exception of pH, temperature and conductivity. Caduceon Environmental is accredited by the Canadian Association for Laboratory Accreditation (CALA). Accredited labs must meet strict provincial guidelines including an extensive quality assurance/quality control program. By choosing these laboratories, OCWA is ensuring appropriate control measures are undertaken during laboratory testing. The pH, temperature and conductivity of samples are analyzed in the field at the time of sample collection by certified operators to ensure accuracy and precision of the results obtained.

OCWA uses several computer systems which include:

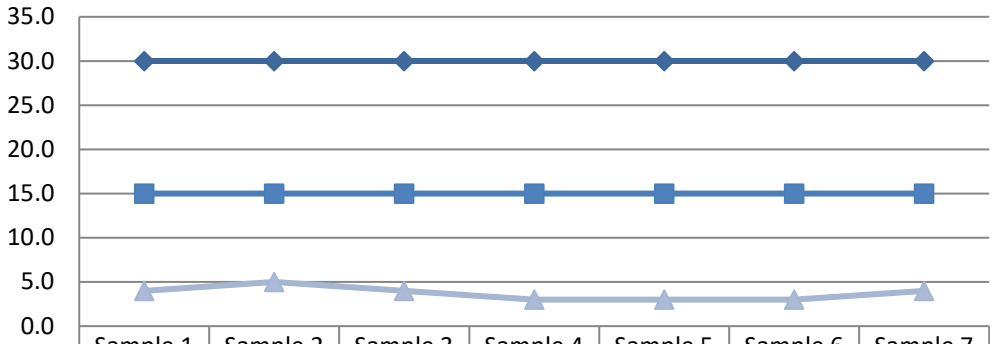
- Process Data Management (PDM)
  - This database consolidates all operational data from a variety of sources including field data, online instrumentation, and electronically uploaded lab test results for reporting, tracking and analysis.
- Maximo – OCWA's Work Management System (WMS)
  - This program is used to track and schedule maintenance activities for all equipment in the system. It is also used to assign specific operational tasks to staff.
- Wonderware (OUTPOST5)/SCADA
  - OCWA's SCADA system allows for process automation, process adjustments, data logging, trending review and remote alarming.

The operations team also has access to a network of compliance and process specialists to assist with process issues.

7.2 Carbonaceous Biochemical Oxygen Demand (5-Day)

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	3.7	15.0	N	30.0	N

Effluent $CBOD_5$ Results:

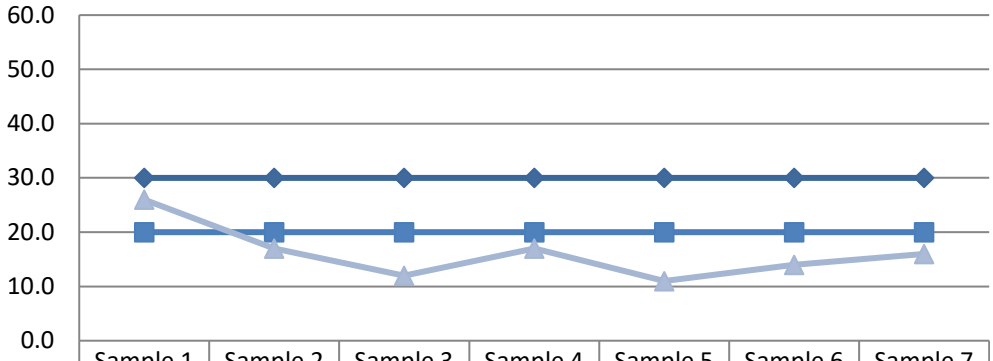


	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Limit (mg/L)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Objective (mg/L)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Result - Spring (mg/L)	4.0	5.0	4.0	3.0	3.0	3.0	4.0

7.3 Total Suspended Solids

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	16.1	20.0	N	30.0	N

Effluent TSS Results:

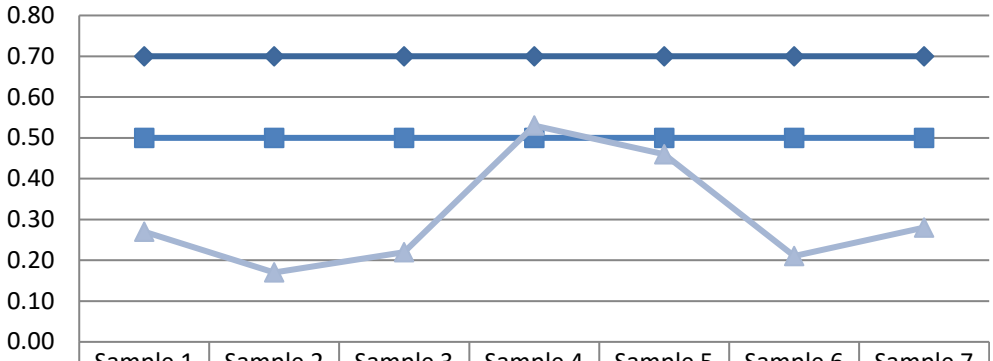


	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Limit (mg/L)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Objective (mg/L)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Result - Spring (mg/L)	26.0	17.0	12.0	17.0	11.0	14.0	16.0

7.4 Total Phosphorus

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	0.31	0.5	N	0.7	N

Effluent TP Results:

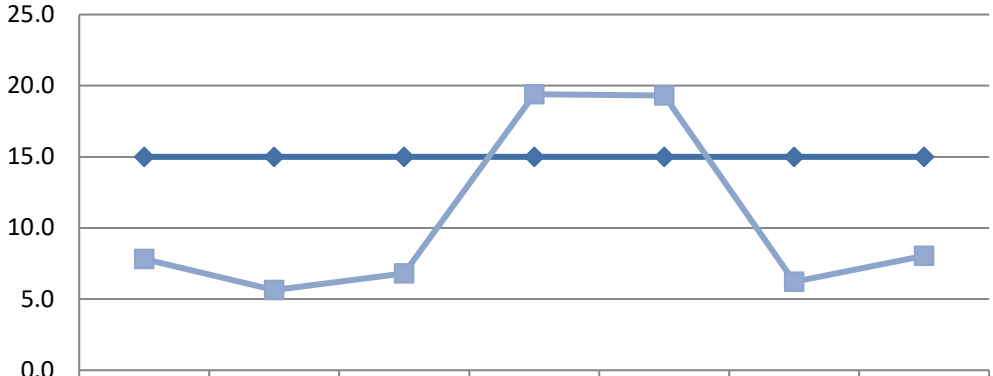


	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Limit (mg/L)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Objective (mg/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Result - Spring (mg/L)	0.27	0.17	0.22	0.53	0.46	0.21	0.28

7.5 Total Ammonia Nitrogen

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	10.5	N/A	N/A	15.0	N

Effluent TAN Results:

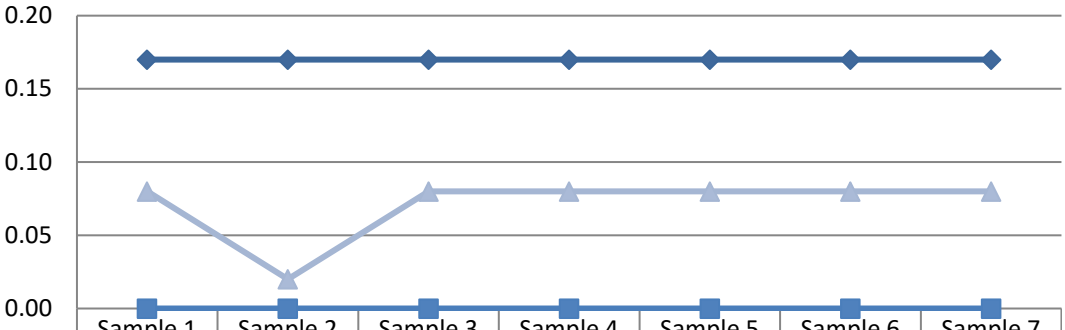


	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Limit (mg/L)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Result - Spring (mg/L)	7.8	5.6	6.8	19.4	19.3	6.2	8.0

7.6 Hydrogen Sulphide

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	0.04	Absent	Y	0.17	N

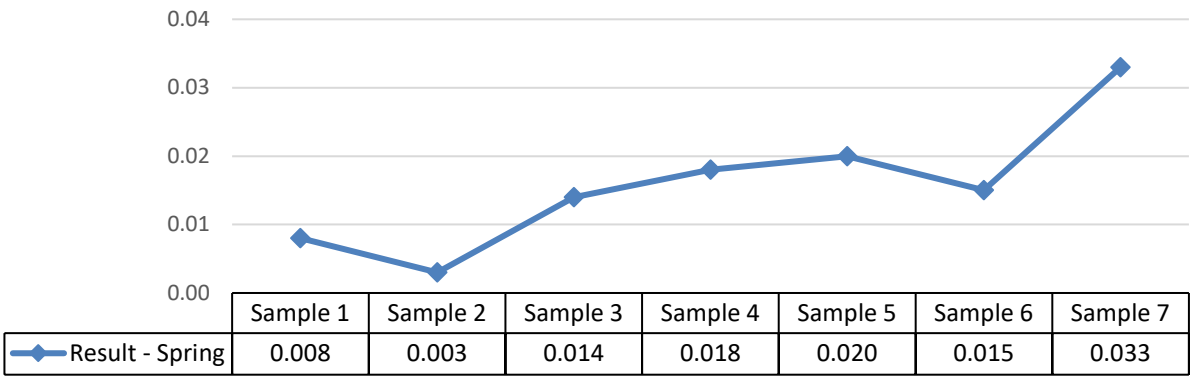
Effluent H_2S Results:



	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Limit (mg/L)	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Objective (mg/L)	0	0	0	0	0	0	0
Result - Spring	0.08	0.02	0.08	0.08	0.08	0.08	0.08

**Note – All results are < 0.08 mg/L except one result of 0.02 mg/L*

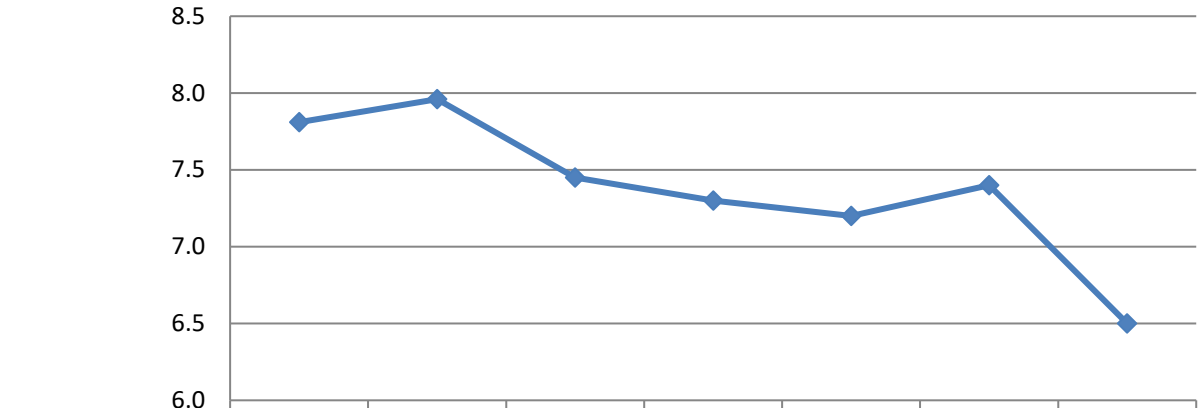
Effluent Undissociated H_2S Results:



	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Result - Spring	0.008	0.003	0.014	0.018	0.020	0.015	0.033

7.7 pH

There are no ECA limits or objectives specified for pH.



	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Result - Spring	7.8	8.0	7.5	7.3	7.2	7.4	6.5

8 Operating Issues

None to report.

8.1 Effluent Quality Non-Compliance Summary

Date	Exceedance of	Limit	Value	Corrective Action
None to report				

8.2 Summary of Abnormal Sewage Discharge Events

Abnormal discharge events include bypasses, overflows, and spills of sewage. No bypass, overflow or spill of sewage occurred during the reporting period. Summary details are included in Appendix C.

8.3 Spills (Other than Sewage)

Date	Location	Details	Volume (m^3)	Start Date and Time	End Date and Time
None to report					

9 Maintenance

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer's and/or industry standards. Maintenance is completed using various tools and operational supports.

OCWA uses a Workplace Management System (WMS). WMS is a maintenance tracking system that can generate work orders as well as provide summaries of completed and scheduled work. During the year, the operating authority generates scheduled work orders on a planned frequency. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is added to the system and completed as required.

Routine planned maintenance activities scheduled in WMS include:

- Inspecting, adjusting and calibrating process control equipment to ensure proper operation of sewage collection systems, pumps, chemical feeders, and all other equipment installed at the facilities.
- Carrying out a routine maintenance program including greasing and oiling as specified in the lubrication schedule.

Planned maintenance activities are communicated to the individuals responsible for completing the task through the issuance of WMS work orders. Work orders are generated automatically on a schedule based on the manufacturer's recommendations and/or site specific operational and maintenance needs, and are assigned directly to the appropriate operations personnel. Work orders are electronically completed in WMS by the person responsible for completing the task.

Unplanned maintenance is carried out as needed.

Suggested capital projects and major maintenance recommendations are provided to the Municipality of North Stormont annually by OCWA. This list is developed by the operations team and provides recommendations for facility components requiring upgrading or improvement.

9.1 Maintenance and Repair Summary

Description
- Completed routine sewer flushing & wet well cleaning - Completed annual inspection of lifting devices - Completed annual generator maintenance and repair - Generator failure – pump truck on site for a few hours during power outage in August - Performed maintenance on both blowers at lagoon – change belts and oil - Rebuilt SPS pump 2 - Installed new underdrain sump pump, alarm float and electrical panel at lagoon

9.2 Flow Meter Calibration and Maintenance

Location	Date of Calibration	Additional Maintenance
Lagoon Effluent Flow Meter (FIT-01)	April 16, 2025	n/a
Lagoon Influent Flow Meter (FIT-02)	April 16, 2025	n/a

9.3 Authorized Alterations in Collection System

Work Order	Details	Significant Drinking Water Threat (Y/N)
None to report.		

9.4 Notice of Modifications

Date	Process	Modification	Status
None to report.			

10 Sludge Generation

Sludge depth is monitored periodically, and plans for sludge removal are made as required for optimal operation of the lagoon system. Sludge levels in all ponds were last measured in 2017. The measurements were as follows:

Lagoon Cell	Sludge Depth
East Cell	2” – 4”
West Cell	2” – 8”

10.1 Sludge Disposal Summary

No sludge was removed or land applied in 2025.

11 Summary of Complaints

Location	Date	Nature of Complaint	Actions Taken
There were no complaints documented during the reporting period.			

Appendix A – Performance Assessment Reports

Moose Creek Wastewater Lagoon – Performance Assessment Report 2025

MONTH	FLOWS				DISCHARGE DURATION	ALUM AVG DOSE	BIOCHEMICAL O2 DEMAND			SUSPENDED SOLIDS			PHOSPHORUS			TKN
	TOTAL FLOW	AVG DAY FLOW	MAX DAY FLOW	EFFLUENT FLOW			AVG RAW BOD	AVG EFF CBOD	PERCENT REMOVAL	AVG RAW SS	AVG EFF SS	PERCENT REMOVAL	AVG RAW PHOS.	AVG EFF PHOS.	PERCENT REMOVAL	AVG RAW TKN
	(m^3)	(m^3)	(m^3)	(m^3)	(days)	(mg/L)	(mg/L)	(mg/L)	(%)	(mg/L)	(mg/L)	(%)	(mg/L)	(mg/L)	(%)	(mg/L)
JAN	6,007	194	289			85	175			170			6.00			51.3
FEB	4,308	154	191			105	305			275			9.91			95.5
MAR	11,234	362	742			103	336			130			6.92			58.6
APR	12,512	417	720	64,454	18	83	68	3.71		144	16.1		2.82	0.31		27.7
MAY	7,513	242	293			54	133			170			3.13			31.7
JUN	5,475	183	216			59	151			226			3.83			32.5
JUL	6,584	212	343			59	106			112			5.42			76.6
AUG	4,817	155	183			60	149			190			7.84			112.0
SEPT	4,173	139	158			53	308			430			8.92			96.7
OCT	4,450	144	206			63	241			250			9.45			86.5
NOV	6,215	207	256			63	102			195			6.09			51.8
DEC	5,976	193	237			58	152			225			6.89			63.0
TOTAL	79,264			64,454	18											
AVG		217				70	186	3.71	98.0	210	16.1	92.3	6.44	0.31	95.2	65.3
MAX			742				336			430			9.91			
CRITERIA		**302**			**20**			**30**			**30**			**0.7**		
COMPLIANCE		YES			YES			YES			YES			YES		

Comment – Percent removal based on 12 months of raw composite samples

	ACTUAL	CRITERIA	COMPLIANCE
DISCHARGE START DATE	11-Apr	Mar.15	YES
DISCHARGE END DATE	28-Apr	Apr.30	YES
MAX DURATION (DAYS)	18	20	YES

GRAB SAMPLE	SAMPLE RESULTS									64,454 m^3
	SAMPLE DATE	11-Apr	14-Apr	17-Apr	21-Apr	23-Apr	25-Apr	28-Apr	Average	**C OF A OBJECTIVE**	**C OF A LIMIT**
START, END, AND EVERY 0.5 M OF DRAWDOWN DURING DISCHARGE	CBOD	4	5	4	<3	<3	<3	4	3.7	**15.0**	**30**
	TSS	26	17	12	17	11	14	16	16.1	**20.0**	**30**
	TP	0.27	0.17	0.22	0.53	0.46	0.21	0.28	0.31	**0.5**	**0.7**
	$NH_3 + NH_4$	7.82	5.64	6.8	19.4	19.3	6.21	8.04	10.5	**N/A**	**15**
	H_2S	<0.08	0.02	<0.08	<0.08	<0.08	<0.08	<0.08	0.04	**ABSENT**	**0.17**
	TKN	11.3	8.3	8.1	20.7	22	10.2	13.7			
	Nitrite	<0.05	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05			
	Nitrate	1.12	2.49	2.4	3.18	2.83	2.53	1.35			
AT LAGOON EFFLUENT DISCHARGE OUTFALL STRUCTURE	pH (on site)	7.81	7.96	7.45	7.3	7.2	7.4	6.5			
	Conductivity (on site)	630	620	680	690	630	720	620			
	Temp (on site)	9.2	9.2	8.9	8.9	9.6	10.3	10.2			
	E. coli *	2300	1600	4900	100	1500	2500	190			
	un-ionized NH3 (calc)**	0.09	0.09	0.03	0.07	0.05	0.03	0.00			
	undissociated H_2S**	0.008	0.003	0.014	0.018	0.020	0.015	0.033			

**Undissociated H2S, unionized NH3, based on in-house calculations
CBOD/SS/TP exceed when the seasonal average exceeds criteria
NH_3/NH_4 & H_2S exceed when single sample result exceeds

UPSTREAM RESULTS								**DOWNSTREAM RESULTS**							
SAMPLE DATE	11-Apr	14-Apr	17-Apr	21-Apr	23-Apr	25-Apr	28-Apr	SAMPLE DATE	11-Apr	14-Apr	17-Apr	21-Apr	23-Apr	25-Apr	28-Apr
CBOD	<3	<3	<3	<3	<3	<3	<3	CBOD	<3	<3	<3	<3	<3	<3	3
TSS	18	7	16	14	8	8	5	TSS	19	10	18	11	8	15	9
TP	0.06	0.04	0.05	0.16	0.03	0.04	0.03	TP	0.12	0.07	0.22	0.12	0.10	0.12	0.14
NH3 + NH4	0.1	0.08	0.12	1.16	0.08	0.25	0.06	NH3 + NH4	0.98	1.58	2.04	1.27	0.53	3.44	3.5
H_2S	0.01	<.01	<0.16	<0.08	<0.01	<0.01	<0.01	H_2S	0.02	0.01	<0.16	<0.08	<0.08	<0.08	<0.08
TKN	1	0.7	0.9	2	0.8	0.9	0.8	TKN	2	2.5	3.1	1.9	3.9	4.3	5.2
Nitrite	<.05	<.05	<0.05	<0.05	<0.05	<0.05	<0.05	Nitrite	<.05	<.05	<.05	<0.05	<0.05	<0.05	<0.05
Nitrate	1.12	4.96	4.66	4.29	5.16	3.51	3.42	Nitrate	5.58	4.34	3.65	4.28	3.84	2.7	2.58
pH	7.9	7.95	7.94	7.81	7.75	7.2	7.0	pH	7.93	7.9	7.83	7.66	7.8	7.15	7.25
Conductivity	660	660	700	710	700	670	710	Conductivity	670	660	620	640	700	690	700
Temp	7.4	7.6	9.3	9.7	10.0	10.0	10	Temp	7.5	7.6	9.7	9.9	10.1	10.0	10.0
E. coli	30	50	110	30	60	20	30	*E. coli*	400	500	350	<10	100	1700	90

	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr
DISCHARGE FLOW (m^3/d)	3110	3110	3110	3283	3197	3197	4320	4320	4320	4320	3715	3715	3456	3456	3456	3456	3456	3456

Daily Loading	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr
BOD (kg)	12	16	16	16	13	13	17	13	13	13	11	11	10	10	10	14	14	14
TSS (kg)	81	53	53	56	38	38	52	73	73	73	63	52	48	48	48	55	55	55
TP (kg)	0.8	0.5	0.5	0.6	0.7	0.7	1.0	2.3	2.3	2.3	2.0	0.8	0.7	0.7	0.7	1.0	1.0	1.0
NH3 (kg)	24.3	17.5	17.5	18.5	21.7	21.7	29.4	83.8	83.8	83.8	72.1	23.1	21.5	21.5	21.5	27.8	27.8	27.8
H2S (kg)	0.12	0.06	0.06	0.07	0.13	0.13	0.17	0.17	0.17	0.17	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.14

	AVG. LOADING (KG/D)	C OF A OBJECTIVE	C OF A LIMIT
CBOD (kg/d)	13.3	**166**	**331**
TSS (kg/d)	57.8	**121**	**331**
TP (kg/d)	1.1	**5.5**	**7.7**
NH3 + NH4 (kg/d)	37.5	**-**	**166**
H_2S (kg/d)	0.13	**-**	**1.90**

		West	East
CELL CONTENTS/ PRE DISCHARGE SAMPLES	SAMPLE DATE	3-Apr	3-Apr
	CBOD (mg/L)	5	5
	TSS (mg/L)	12	14
	TP (mg/L)	0.62	0.48
	NH3 + NH4 (mg/L)	15.5	11.5
	TKN (mg/L)	16.9	14.1
	S2-	< 0.08	< 0.08
	E. coli	1100	2100

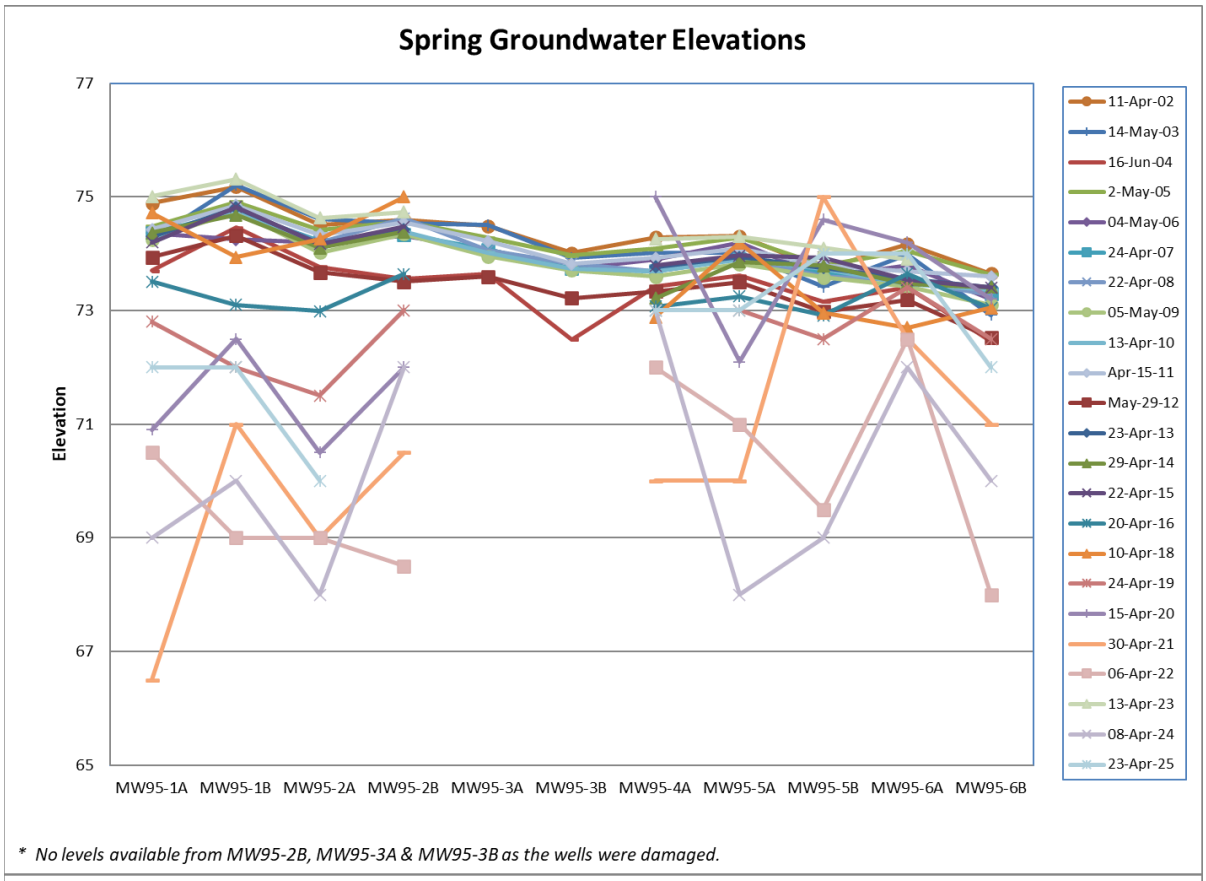
DETERMINATION OF UN-IONIZED AMMONIA (NH_3) IN WASTEWATER EFFLUENT

Sample Date	Sample Stream Temperature (°C)	Degrees Kelvin	Dissociation Constant pKa	Sample pH on-site	Fraction of Un-ionized Ammonia	Total Ammonia (mg/L) (NH_3 +NH_4+as N)	Un-ionized Ammonia (mg/L)
11-Apr	9.2	282.4	9.76	7.81	0.0111	7.82	0.0870
14-Apr	9.2	282.4	9.76	7.96	0.0156	5.64	0.0882
17-Apr	8.9	282.1	9.77	7.45	0.0048	6.8	0.0325
21-Apr	8.9	282.1	9.77	7.3	0.0034	19.4	0.0657
23-Apr	9.6	282.8	9.75	7.2	0.0025	19.3	0.0489
25-Apr	10.3	283.5	9.72	7.4	0.0048	6.21	0.0295
28-Apr	10.2	283.4	9.72	6.5	0.0006	8.04	0.0048

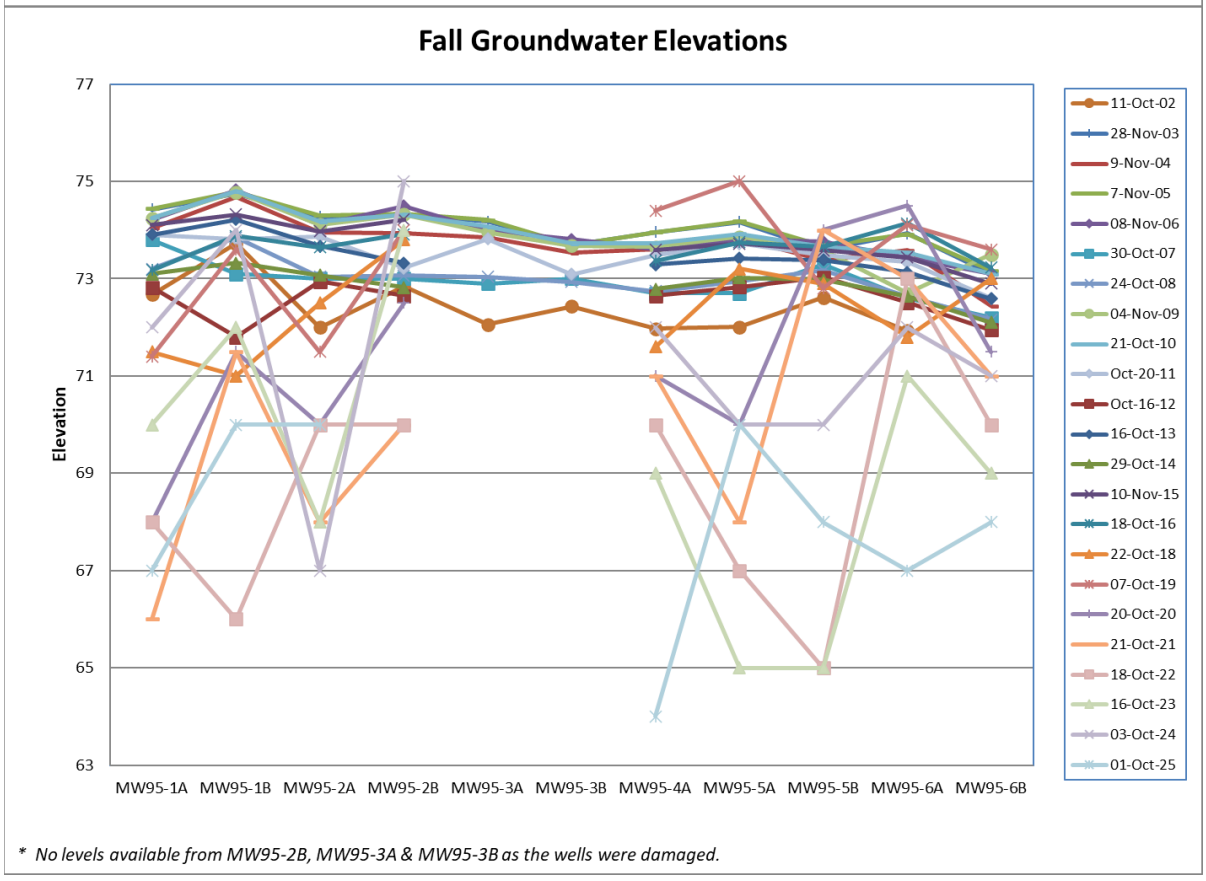
Appendix B – Groundwater Monitoring Results

Lagoon Underdrain Groundwater Sample Results

	DATE	23-Apr-25	1-Oct-25
MW95-1A			
	Total Coliforms	200	300
	Faecal Coli	<2	<2
	DRP	0.063	0.074
	Ammonia (N-NH3)	1.26	0.59
	Nitrite (N-N02)	0.06	0.14
	Nitrate (N-NO3)	0.17	0.65
	Total Phosphorus	2.71	2.73
	Conductivity	410	440
	pH	7.68	8.16
MW95-1B			
	Total Coliforms	20	<10
	Faecal Coli	<2	<2
	DRP	0.027	0.025
	Ammonia (N-NH3)	0.54	0.36
	Nitrite (N-N02)	<0.05	<0.05
	Nitrate (N-NO3)	0.1	<0.05
	Total Phosphorus	2.14	6.76
	Conductivity	896	593
	pH	7.74	8.17
MCL-2000 (Lagoon in use)			
	Total Coliforms	4400	78000
	Faecal Coli	390	18400
	DRP	0.231	0.007
	Ammonia (N-NH3)	22.4	4.47
	Nitrite (N-N02)	0.05	<0.05
	Nitrate (N-NO3)	0.14	<0.05
	Total Phosphorus	0.51	3.13
	Conductivity	926	971
	pH	7.25	7.93
MCL-1000 (Lagoon Underdrain)			
	Total Coliforms	<10	3300
	Faecal Coli	<2	6
	DRP	<0.002	0.006
	Ammonia (N-NH3)	1.55	0.86
trigger 0.33mg/L	**Nitrite (N-N02)**	**<0.05**	**<0.05**
trigger 3.36mg/L	**Nitrate (N-NO3)**	**0.17**	**0.80**
	Total Phosphorus	0.04	0.1
	Conductivity	834	930
	pH	6.95	8.04



** No levels available from MW95-2B, MW95-3A & MW95-3B as the wells were damaged.*



** No levels available from MW95-2B, MW95-3A & MW95-3B as the wells were damaged.*

Appendix C – Details of Abnormal Sewage Discharge Events

Event Details Summary

Facility Bypass

Date	Location	Details	Volume (m³)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
None to report.								

Facility Overflow

Date	Location	Details	Volume (m³)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
None to report.								

Collection Overflow

Date	Location	Details	Volume (m³)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
None to report.								

Spills of Sewage

Date	Location	Details	Volume (m³)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
None to report.								

Collection System Monitoring Data

Event Date	Event Location	Volume (m³)	Parameter	mg/L	Source Loading (kg)	Any Adverse Impacts & Corrective Actions
n/a	n/a	n/a	BOD5	n/a	n/a	n/a
			Total Suspended Solids	n/a	n/a	
			Total Phosphorus	n/a	n/a	
			Total Kjeldahl Nitrogen (TKN)	n/a	n/a	
			E.Coli	n/a		

Appendix D – ECA Annual Report Requirements

Facility CofA #3-1555-91-936 **Section 17(3)**	**Section in Report**
6(a) Executive summary;	Operations and Compliance Reliability Indices
6(b) Tabulation of all sample results obtained during the reporting period, including date, sampling location and type of sample;	Raw Sewage Quality Effluent Quality Appendix A
4(c) Tabulation of calculated un-ionized ammonia concentrations in final effluent, based on Ammonia + Ammonium Nitrogen concentrations, temperature and pH of final effluent;	Appendix A
4(d) Tabulation of concentration of undissociated hydrogen sulphide in final effluent, based on temperature, pH and conductivity;	Effluent Quality Appendix A
4(e) Tabulation of daily flow rates and monthly volumes including average daily flows for periods reported;	Wastewater System Flows Appendix A
4(f) Tabulation and description of all bypass, emergency and upset conditions events that took place during the reporting period;	Operating Issues Appendix C
4(g) Results of the ground water monitoring program as described in condition No. 16;	Groundwater Monitoring Program Appendix B
4(h) An overview of the sludge disposal program, including tabulation of quantity and quality of sludge and the disposal areas used for each sludge source during the reporting period, together with an outline of the proposed sludge handling method and disposal areas to be utilised over the next reporting period.	Sludge Generation

Collection ECA #182-W601 **Schedule E**	
4.6.3 If applicable, includes a summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations.	Operating Issues
4.6.4 Includes a summary of any operating problems encountered and corrective actions taken.	Operating Issues
4.6.5 Includes a summary of all calibration, maintenance, and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System.	Maintenance
4.6.6 Includes a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints.	Summary of Complaints
4.6.7 Includes a summary of all Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat.	Maintenance
4.6.8 Includes a summary of all Collection System Overflow(s) and Spill(s) of Sewage, including: a) Dates; b) Volumes and durations; c) If applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E.coli; d) Disinfection, if any; and	Operating Issues Appendix C

Collection ECA #182-W601 **Schedule E**	
e) Any adverse impact(s) and any corrective actions, if applicable.	
4.6.9 Includes a summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including the following items, as applicable: a) A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted. b) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines. c) An assessment of the effectiveness of each action taken. d) An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives. e) Public reporting approach including proactive efforts.	Maintenance Operating Issues